

# UAS Project Proposal

**Project Title:** Unmanned Aircraft System (UAS) Monitoring of Endangered Mississippi Sandhill Cranes

**Project Point of Contact:**

Name:

Agency:

Phone:

Email:

**Introduction/Background:**

The Mississippi sandhill crane is an endangered non-migratory subspecies found only in the wild on an location adjacent to the 19,000 acre Mississippi Sandhill Crane National Wildlife Refuge in Jackson County, Mississippi. With 100-1000 cranes, it is one of the rarest bird populations in North America. Long-term monitoring of abundance, productivity, and other parameters is a high priority objective in the Mississippi Sandhill Crane Recovery Plan and the refuge Comprehensive Conservation Plan.

Unmanned Aircraft Systems (UAS) have a high potential to benefit crane recovery and refuge conservation missions. The Dept. of the Interior UAS have been used successfully to conduct wildlife population surveys (including sandhill crane abundance surveys at Monte Vista NWR in Colorado), vegetation mapping, and to support mapping and surveying missions. The UAS are relatively inexpensive and much safer to operate than manned aircraft, provide large area coverage compared to ground observations, and provide high resolution geo-referenced archival video and still frame imagery for use and analysis.

**Project Location:**

UAS Raven A and T-Hawk flight operations will be used at the Mississippi Sandhill Crane NWR, Jackson County, Mississippi.

Area of interest:

Point	Latitude	Longitude
1 NW	30°31'10.7304"N	88°51'18.3917"W
2 NE	30°31'13.0471"N	88°35'56.0143"W
3 SE	30°21'44.0224"N	88°35'49.9762"W
4 SW	30°21'39.2582"N	88°51'13.7723"W

(Bounding coordinates or center point and radius)

**Project Date:** The planned operational use is January 1, 2014 through January 1, 2015.

**Why is it important to use UAS technology?**

Existing project results have demonstrated the utility of UAS for conducting bird surveys in open areas, including sandhill cranes roosting in water and sage grouse in desert scrub. UAS have the potential to be the most cost effective, safest, efficient, and least wildlife invasive means of detecting endangered Mississippi sandhill cranes. Use of high-resolution infrared (thermal) sensor data will provide a highly precise detection of roosting and, potentially, nesting cranes. High resolution color imaging data will provide detection of individual cranes, nests and crane families.

**Have you considered any other technology? Why was that technology not sufficient?**

Refuge has attempted using manned fixed-wing aircraft (e.g. Cessna 172) with 1-2 observers but, cranes were not detected due to the aircraft speed and altitude required for safe flights. The refuge has used manned helicopters (Bell Jet Ranger) with three observers to successfully conduct crane surveys, but costs are prohibitive and recent budget cuts to the fire hazard reduction program resulted in zero helicopter time in FY13. Walking observers conducting ground surveys have been used for years but necessary staff resources are no longer available and this technique can cause disturbance and nest abandonment, as well as, attract nest predators. Furthermore, none of these three techniques utilized remote sensing with associated high-res multispectral and IR data for sophisticated analysis and archival capability.